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Operational and Mission Highlights

A MONTHLY SUMMARY OF TOP ACHIEVEMENTS

April 2021

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DARHT Returns to Experimental Operations, Marking End of Weather Enclosure Restoration

The Dual Axis Radiographic Hydrodynamic Test (DARHT) team performed simultaneous operations of Axis I and Axis II in executing a detonator test, which also involved high-explosive operations. This is a key step to demonstrate DARHT's readiness to execute hydrodynamic experiments after the installation of its new weather enclosure. Personnel are currently performing static measurements. The first dynamic experiment at DARHT is planned for May. The installation of the weather enclosure enables the execution of DARHT hydro tests in a more controlled environment.

Ejecta Hydride Model to Capture Reaction Rates

Laboratory scientists have demonstrated through experiments that metal ejecta particles react with hydrogen gas, releasing heat that raises particle temperature above initial particle and gas temperatures. One hypothesis that explains this behavior is that the metal particle reacts with the hydrogen gas to form a hydride crust on its surface, with the reaction rate limited by the rate at which hydrogen diffuses through the hydride crust.

Based on this hypothesis, Laboratory scientists created and implemented a computer model. The model satisfactorily reproduces the rise and fall of particle temperature to within 4% of experimental values. Researchers are developing further improvements and comparison techniques to refine the model. Susan Kurien of Fluid Dynamics and Solid Mechanics (T-3) is the PEM Mix and Burn Project Lead on this project.

Enhanced Capabilities for Subcritical Experiments Accelerator Preliminary Design Review Executed

Level 3 Preliminary Design Reviews (PDR) of the Downstream Transport and the Detector took place March 23 and 24, 2021. The Critical Decision-3A (an approval of the project's final design that authorizes release of funds for construction) documents for the detector will be submitted for an Energy System Acquisition Advi-

sory Board Equivalent review. Approval is anticipated before the end of April 2021 or so.

Equipment Calibration Supports Quicker Plutonium Measurement

In mid-March, 2021, Laboratory personnel successfully calibrated both of the Plutonium Facility's Solution Assay Instruments (SAIs), one in the aqueous chloride processing room and the other in the aqueous nitrate processing room. Calibration of both SAIs will enable rapid plutonium measurement without having to sample out for radiochemistry. The SAIs will also serve as backup capabilities for each other.

The SAI was made operational and qualified for use last summer for the first time since 2012. The instruments support software that tracks nuclear material accountability. To calibrate the instrument, teams measure and validate material readings with real-world samples. All these efforts in part enable the implementation of new criticality safety limits, which will dramatically increase material output to better support the pit-manufacturing mission.

Experiment Uses Optical Pyrometry to Measure Temperatures of Shocked Plutonium on 40-mm Gun

Laboratory researchers, working with collaborators from Mission Support Test Services — a limited liability company consisting of Honeywell Inc., Jacobs Engineering Group Inc., and HII Nuclear, Inc. — have worked for more than a decade to develop and implement an optical pyrometry method. This new method measures the temperature of metals shocked to high pressures and temperatures.

Because traditional shock-wave measurements provide information only on the mechanical state of the material, temperature measurements must be taken to validate and improve equation-of-state models for materials. The conditions sampled are complex, commensurate with those found in planetary impacts and in relation to conventional and nuclear weapons.

Optical pyrometry is currently the best available method for inferring the temperature of shocked metals. This method involves the careful measurement of the calibrated radiance emitted by a surface at finite temperature. These measurements are difficult, often further complicated by the short time scales associated with shock-wave experiments coupled with the many

sources of nonthermal light (impact flash, fracture light, etc.) that pollute the radiant light measured from the sample.

The Laboratory Conducts Explosively Driven Dynamic Load Test for Pu@pRad Inner Containment Vessel

This series of tests is an important step in qualifying this blast-rated vessel. The project team has also developed mock-exercises to refine post-shot procedures for both normal and abnormal scenarios in the Los Alamos Neutron Science Center test area to ensure vessel designs will accommodate radiological best practices in assembly and handling.

Laboratory Standing Up New Associate Laboratory Directorate for Plutonium Infrastructure

To support work underway at the Los Alamos Plutonium Pit Production Project (LAP4) and other associated plutonium infrastructure projects, Laboratory Director Thom Mason announced the creation of an additional directorate within the Weapons Program. The new Associate Laboratory Directorate for Plutonium Infrastructure (ALDPI) will be responsible for projects that support the following:

- Plutonium Center of Excellence,
- LAP4,
- Chemistry and Material Research Replacement Project,
- TA-55 Reinvestment (TRP III) Project, and
- related programmatic equipment installations and capability-based investment projects.

With this new directorate's focus on plutonium infrastructure, the Laboratory will be better positioned to expand this portfolio with the advent of LAP4. Capital Projects, along with other directorates, will provide support through matrix deployment and limited direct transfer of personnel to ALDPI.

Major Lab Renovation at Sigma Will Enable Weapons-Production Mission

In March 2021, personnel completed a major renovation at the Laboratory's Sigma facility, which supports research and manufacturing for the weapons program at large. This support includes items for the Weapons Production Directorate, such as finishing for ALT 940 assemblies.

Starting in January 2019, the electrochemistry area at the Sigma facility underwent a major cleanup and renovation. The total area of the renovation was 4,000 square feet of lab space. A variety of teams and employees collaborated to

- plan the project,
- remove contamination from the aging facility,
- gut the room of all former equipment and tanks, and
- install brand new electrical, plumbing, ventilation, and equipment to support electrochemistry efforts.

Most construction and installation activities were completed while adhering to COVID-19 controls and protocols. Electrochemistry is a key characteristic of producing materials and components, supporting pre- and post-production cleaning processes, surface characterization and corrosion studies. The renovation transformed the room from being nearly unusable to an advanced processing center that will support the nuclear enterprise at large.

National Ignition Facility, Los Alamos, and Lawrence Livermore Neutron Imaging Team Collects First Gamma Ray Images with New NIS II System

Gamma images enable this new NIS II system to measure the shape of the ice layer and surrounding shell in a DT (drift tube) capsule implosion, thus providing information about the shape of the ablator material — a resource that is a vital component of most heat shields — at peak compression. These data help researchers better understand the performance of the inertial confinement fusion (ICF) capsule assemblies and are an important capability more generally for burn experiments that support stockpile stewardship.

ReGenerate Video Program Preserves Weapons Knowledge for Future Innovation

Personnel within the Weapons Physics (ALDX) Directorate are using a Weapons Knowledge Management (WKM) program to pilot a new video-capture initiative called ReGenerate. Regenerate helps preserve essential weapons-related scientific and technical knowledge for present and future work at the Laboratory. Pilot completion and official rollout of ReGenerate is expected in August 2021.

ReGenerate uses a set of standardized processes, roles, and tools to record knowledge on video through one-on-one interviews with subject-matter experts. Once edited, personnel link recordings to WKM's Weapons Video Service platform, within which classified videos can be accessed and used for learning, research, and sharing. The goal of this initiative is to apply unique knowledge to current and future processes, problem solving, and decision-making.

TA-55 Digitization Lab Stood Up in March, Supports Laboratory's Critical Pit Production Mission

Weapons Research Services and the National Security Research Center (the Lab's classified library) stood up a new digitization lab for TA-55 (Plutonium Science and Manufacturing) in March 2021, making weapons production-related records, known as the Rocky Flats Collection, accessible to Weapons Program scientists and engineers.

This TA-55 digitization lab is the seventh such lab that the NSRC has stood up in the past year at the Laboratory in an effort to make available one-of-a-kind nuclear weapons materials. For TA-55 in particular, this means digitizing materials used to fulfill the Lab's pit production work and meet project milestones. As such, millions of hard-copy media are transferred into electronic formats so they can be more easily searched, accessed, and stored.

TA-55 Teams Receive NA-50 Excellence Awards

The following two TA-55 teams were among the 12 teams at the Laboratory to receive the NA-50 2020 Excellence Award: the PF-4 capital column testing team,

and the Radioassay and Nondestructive Testing (RANT) facility operational readiness and expanded-shipping capability team.

NA-50 (the NNSA Office of Safety, Infrastructure and Operations) works to ensure that (1) existing architecture is operated safely and managed effectively, and (2) new facilities are adequately maintained to meet mission needs. The award recognizes teams and individuals for outstanding accomplishments involving innovation, effectiveness, teamwork, overcoming adversity, and enabling future success. At the Laboratory, success in infrastructure and operations is no small feat, as employees work amidst aging facilities and rapidly expanding operations.

The Plutonium Facility (PF-4) capital column testing team participated in a partnership at the University of Nevada-Reno Earthquake Engineering Laboratory to define the capacity of the capitals that exist at the top of every column that supports the PF-4 laboratory floor. The testing results indicated that the capitals are not vulnerable to expected seismic demand in ways previously believed. The RANT team transitioned to safe and expeditious transuranic (TRU) waste shipments to lower the TRU waste inventory and support the plutonium missions at LANL. At the time of the award submission, TRU waste storage capacity use at TA-55 storage had dropped to 36 percent — significantly below the milestone of 50 percent — and has since dropped to 34 percent.

These teams and others nominated exemplify the best of the Laboratory's commitment to safety and smooth operations amidst changing infrastructure.

Weapons Production Team Extends 42 Job Offers After Successful Two-Day Hiring Event

Through monthly virtual hiring events, the Associate Laboratory Directorate for Weapons Production (ALDWP) continues to hire quality candidates to support the Laboratory's production mission. The latest hiring event in March 2021 — one that focused on R&D engineer and program manager positions — yielded 42 ALDWP job offers after conducting more than 80 interviews in just two days.

April 2021's hiring event will focus on technician, machinist and program manager positions, and it will likely be the most highly attended hiring event to date. Laboratory personnel continue to make significant

process improvements, thus resulting in increasingly effective virtual hiring events.

XTD Design Physicists Brief the Laboratory's Deputy Director for Weapons on Stockpile Devices

During the week of April 12, 2021, design physicists from X-Theoretical Design (XTD) responsible for conducting annual assessments of the physics performance of stockpile weapons, known as Points of Contact, presented briefs to Deputy Director for Weapons Bob Webster. Assessments underwrite the annual certification of the warheads by the Laboratory Director.

For more than eight hours over three days, Webster received updates on the state of modeling and simulation, the development of baseline models (including safety baselines for the first time), the collection and use of new data, and progress on evaluating Significant Finding Investigations. Highlights included advances in 3D simulations, full-system modeling, and standardization.

SCIENCE, TECHNOLOGY, AND ENGINEERING

High Performance Computing Receives Extension of Approval to Operate for Its Secret Restricted Data

High Performance Computing at the Laboratory has received an extension of Approval to Operate its Secret Restricted Data computing for another three years. This approved plan maintains an agreement of cluster lifecycle management previously developed more than two years ago. This method of operation and accreditation, based on continuous monitoring, removes what in the past had been a serious bottleneck in placing new clusters into operation, specifically their individual accreditation. With continuous monitoring and a formal and transparent change-control process, new clusters that meet current security controls can simply be integrated into the accredited network.

How Climate Change Drives Extreme Weather and Water Events

New research by Katrina Bennett of the Laboratory's Earth and Environmental Sciences Division made a big

splash in local and regional news outlets. In her latest paper, "[Concurrent Changes in Extreme Hydroclimate Events in the Colorado River Basin](#)," Bennett and her team examined how climate change is driving extreme weather/water events, such as droughts, heat waves, floods, and low river flows. These events tend to gang up and strike at the same time, with detrimental impacts on water users throughout a seven-state region — this problem will increase over the next 50 or more years. The topic fits well with new national attention on climate research, an area of strength at the Laboratory.

Given the ongoing drought across the Southwest and recent coverage of diminished river flows on both the Rio Grande and the Colorado River, personnel pitched the story to regional media. As a result, members of the media wrote several key articles, including a piece that ran on the [front page of the main edition of the Albuquerque Journal](#), as well as stories in the [Arizona Republic](#), [New Mexico Political Report](#), [Environmental News Network](#), [Phys.org](#), and [Science Daily](#). The Associated Press is also interested in doing a story for summer 2021.

Improved Proton Beam Delivery Boosts Production of High-Demand and New Medical Isotopes

A recent Laboratory project has increased output at the Isotope Production Facility. Nuclear scientists developed a new particle-beam system that delivers subatomic particles to modify atoms, transforming them into valuable isotopes. They also developed new diagnostic instruments, a new adjustable targeting "iris" and a sophisticated focusing system. These improvements make it possible to direct the proton beam onto targets of different sizes. The project increased isotope production by 30 percent and paves the way for future increases by as much as 60 percent.

Laboratory Postdoc Chuck Abolt Selected for Prestigious Nobel Laureate Meeting

Every year, dozens of Nobel Laureates convene in Germany to meet the next generation of the world's leading scientists. This year, the event will attract 600 undergraduates, PhD students, and postdoctoral researchers.

Nominated by the Laboratory and selected by the University of California, EES-16 (Computational Science)

postdoc Chuck Abolt, a hydrologist and recent R&D 100-award winner, will join this year's selective group. The 70th Lindau Nobel Laureate Meeting will be held in late June 2021 in Inselhalle to foster the exchange of knowledge and ideas. The meetings focuses alternately on physiology/medicine, physics, chemistry, economics, and this year's interdisciplinary meeting (three natural sciences).

Laboratory Supercomputer Simulations Reveal How Dominant COVID-19 Strain Binds to Host, Succumbs to Antibodies

Large-scale supercomputer simulations at the atomic level show that — compared to other variants — the dominant G-form variant of the COVID-19-causing virus is more infectious partly because of its greater ability to bind readily to its target host receptor in the body. These results from a Laboratory-led team illuminate the mechanism of both infection by the G form and antibody resistance against it. This understanding could help in future vaccine development.

Researchers knew that the variant, also known as D614G, was more infectious and that antibodies could neutralize it, but they did not know how. Simulating more than a million individual atoms, a process that required approximately 24 million CPU hours of supercomputer time, the new work provides molecular-level detail about the behavior of this variant's spike.

Machine Learning Accelerates NEST Workflow

The principal objective of the Laboratory's Nuclear Emergency Support Team (NEST) is to disarm or disable nuclear threats. To assess threats and predict the consequences of addressing threats, the NEST team uses a new software known as Cactus, which takes advantage of a suite of Laboratory-developed advanced simulation and computing models.

Because speed is critical, Cactus applies advanced machine-learning techniques to predict features of the longest-running simulation in the suite. The system generates predictions that are orders of magnitude faster than the simulation runtime, thus enabling triage among competing device models. Ultimately, these machine-learning predictions can significantly speed up NEST workflow that deals with assessing nuclear threats. Michael Lang of CCS-DO (Computer, Computa-

tional and Statistical Sciences Division Office) serves as the Advanced Technology Development and Mitigation Program Manager for this project.

New Artificial-Intelligence Tool Tracks Evolution of COVID-19 Conspiracy Theories on Social Media

A new machine-learning program accurately identifies COVID-19-related conspiracy theories on social media and models how they evolved over time — a tool that could someday help public-health officials combat misinformation online. Published last week in the *Journal of Medical Internet Research* and highlighted in a Laboratory news release, the study used publicly available, anonymized Twitter data to characterize four COVID-19 conspiracy-theory themes and provide context for each through the first five months of the pandemic.

The four themes the study examined were that (1) that 5G cell towers spread the virus; (2) the Bill and Melinda Gates Foundation engineered or has otherwise malicious intent related to COVID-19; (3) the virus was bioengineered or was developed in a laboratory; and (4) the COVID-19 vaccines, which were then still in development, would be dangerous.

New Pulsed Magnet Reveals a New State of Matter in Kondo Insulator

A recent series of experiments at the Laboratory's National High Magnetic Field Laboratory (National MagLab) leveraged some of the nation's highest-powered nondestructive magnets to reveal an exotic new phase of matter at high magnetic fields. The experiments studied the unusual Kondo insulator ytterbium dodecaboride (or YbB₁₂), yielding the first results from the new 75-tesla duplex magnet housed at the National MagLab's Pulsed Field Facility at Los Alamos. Researchers from the University of Michigan, Kyoto University and the Laboratory conducted the research, published last week in [Nature Physics](#).

New Research Shows that Mars Did Not Dry Up All at Once

Although media attention has focused on the Perseverance rover that landed on Mars last month, its predecessor Curiosity continues to explore and make discoveries at the base of Mount Sharp on the Red

Planet. Research published in the journal *Geology* and highlighted in a LANL news release shows that Mars had drier and wetter eras before drying up completely approximately 3 billion years ago.

Using the long-range camera aboard ChemCam, the rock-vaporizing laser that sits on the mast of the Curiosity rover, to make detailed observations of the steep terrain of Mount Sharp, a team including scientist Roger Wiens and other researchers at the Laboratory discovered that the Martian climate alternated between dry and wetter periods before it went completely dry. Spacecraft in orbit around Mars have previously provided clues about the mineral composition of the slopes of Mount Sharp. Now, ChemCam has successfully made detailed observations of the sedimentary beds from the planet's surface, revealing the conditions under which they formed.

New Software Solution Will Help Run Multiple Cluster Connections

To avoid the X11 forwarding bottleneck when running graphical tools on High Performance Computing (HPC) headless server resources at the Laboratory, the Programming & Runtime Environments Team from HPC-ENV (Environments) developed a software solution that abstracts away the complexity of the setup of a Secure Shell encrypted tunnel VNC (Virtual Network Connection) from a desktop system to all HPC resources.

[VNC2HPC](#) requires minimal setup on a desktop (VNC Viewer client, VNC2HPC script). Once setup, it instantiates either a remote VNC session on the login nodes of Laboratory clusters or launches a VNC server instance in a new or existing HPC job allocation. The tool runs a lightweight window manager, instead of a full desktop environment, and it performs checks to ensure that customers are limited to one instance per resource to minimize detrimental impact to shared resources.

Additional features include

- support for a variety of window managers,
- geometry and pixel-depth window-setting options,
- knowledge of the required multi-hop infrastructure requirements for some of the Laboratory's systems,
- advanced Slurm job request capabilities,
- randomly generated or user-specified requests for nonstandard VNC port usage,

- the "--keep" option to ensure that a session can persist after disconnection of the VNCViewer, and
- the ability to re-use or destroy running sessions upon reconnection.

Using session-specific SSH (Secure Shell) control master socket connections, the user can have multiple cluster connections of VNC2HPC on their desktop.

This software currently supports Linux and MacOS desktop systems. Although the Windows VNC2HPC solution is under development, those who wish to run it on a Windows OS desktop should set up a Windows Subsystem for Linux (WSL) configuration.

A Novel Understanding of How Majorana Neutrinos Induce Neutrino-Less Double Beta Decay

Scientists recently demonstrated that a novel short-range nucleon-nucleon interaction must be included when reliably calculating how fast atomic nuclei undergo neutrino-less double beta decay. However, the magnitude of this new contribution remained unknown, leading to severe theoretical uncertainties.

To address this issue, Vincenzo Cirigliano and Emanuele Mereghetti of Nuclear and Particle Physics, Astrophysics and Cosmology (T-2), along with collaborators from the University of California San Diego, Bern and NIKHEF (National Institute for Subatomic Physics), have developed a new method to calculate the strength of the short-range coupling, validated through data on charge-independence-breaking in nucleon-nucleon scattering lengths. The results of this work confirm that the short-range contribution will have a significant and beneficial impact on interpreting positive or null experimental results in terms of the neutrino Majorana mass. The full paper was accepted in [Physical Review Letters](#).

OP-ED: Fighting the Next Outbreak Before It Starts

In an op-ed published in the [Santa Fe New Mexican](#), as well as the [Los Alamos Reporter](#) and the [Los Alamos Daily Post](#), F. Patrick Fitch and Kirsten Taylor-McCabe addressed lessons learned during the last year of the COVID-19 pandemic, namely that an effective response against a disease outbreak depends on timely integration of expertise and data across academia, industry, and government. It argued that, as we move forward,

we must continue to foster this integration and our capabilities so we can effectively respond to future threats.

The op-ed noted that, for any disease outbreak, there are two well-understood sides of the response: research and development (which looks closely at the disease to determine its origins, how it spreads, pharmaceutical interventions, etc.), and operations (which includes determining and communicating decisions, distributing test kits, personal protective equipment, and vaccines, etc.). But there is an important part of the scientific response between these two pieces that is often overlooked: evaluation and translation to actionable knowledge and market-ready products. The Laboratory has helped fulfill that need during COVID-19 and it should continue to ensure our readiness for the future.

Postdoctoral Fellow DiMucci Receives 2021 Young Investigator Award

An Agnew National Security Postdoc Fellow in the Laboratory's Inorganic, Isotope and Actinide Chemistry group (C-IIAC), Ida DiMucci has been recognized with the 2021 American Chemical Society (ACS) Division of Inorganic Chemistry Young Investigator Award. DiMucci earned this award for her PhD thesis.

DiMucci's research had two main thrusts: (1) working on developing and applying synchrotron-based X-ray spectroscopies to elucidate the electronic structures of coordination complexes with metals in unusual oxidation states, and (2) studying catalytic reactivities of transition metal complexes through their electronic structures. She contributed a significant development to a spectroscopic method called N K-edge XAS (X-ray Absorption Spectroscopy), and she has applied experiment and theory to chemical problems in transition metal reactivity/electronic structure. Notified of her award on April 2021, DiMucci will be honored during the ACS 2021 Fall National Meeting. Read the story in [LANL Today](#) for more details.

Ultra-High-Energy Gamma Rays Originate from pulsar Nebulae

The discovery that the nebulae surrounding the most powerful pulsars are pumping out ultra-high-energy gamma rays could rewrite the book about the rays' galactic origins. Pulsars are rapidly rotating, highly

magnetized collapsed stars surrounded by nebulae powered by winds generated inside the pulsars.

Laboratory researchers took advantage of the wide field-of-view and survey capabilities at the High Altitude Water Cherenkov Observatory (HAWC) in Puebla, Mexico, to search around a collection of powerful pulsars. Researchers found significant evidence that ultra-high-energy gamma-ray emission is a universal feature found near these objects. The HAWC Collaboration consists of more than 100 international researchers, and their research is detailed in a [new study](#) of gamma radiation from pulsars.

MISSION OPERATIONS

Capital Projects Streamlines Injury- and Incident-Reporting Process

Effective April 5, 2021, Associate Laboratory Directorate for Capital Projects (ALDCP) employees at the Laboratory will no longer use the aldcp-injury-incident@lanl.gov email process for incident and/or injury notifications. Instead, these employees will use a new process that consists of two basic steps:

1. Call 505-667-2400 to notify the Emergency Operations Service Center, and
2. Notify the appropriate manager (line manager, construction manager, project manager, etc.).

This change has been made based on valuable feedback from ALDCP employees, managers, and leadership team members, as well as from their partners in the Associate Laboratory Directorate for Facilities and Operations and the Associate Laboratory Directorate for Environment, Safety, Health, Quality, Safety and Security. Leadership acknowledged employee concerns, which led to the process improvement.

The updated procedure will streamline the notification actions by including the Laboratory-wide initiative to call 7-2400 in the event of an incident and/or injury. The operators will notify the appropriate personnel in Facility Operations Division and the Division Leader.

Chiller Upgrades at Radiochemistry Complex Reduce Laboratory's Water Use

Personnel have installed two new 300-ton chillers in the Laboratory's Radiochemistry Complex (RC) at TA-48-0001. According to Paul Blumberg of the Science and Technology Operations Division, the chilled water from RC-1 cools sensitive equipment, preventing it from overheating.

This upgrade ensures that the Laboratory's Chemistry Division continues its core national security work in weapons science and threat reduction by implementing advanced chemical science and technology. These new chillers are air-cooled rather than water-cooled, thus eliminating the previous use of New Mexico's precious water supply. Installation required new chill-water piping and electrical work.

The complex's old chillers had failed five years ago, and the Science and Technology Operations Division temporarily installed one chiller to continue operations. Personnel will remove the old chillers from the facility, freeing up valuable space for future facility upgrades.

Facilities and Operations Successes in February Support Future Production

February 2021 brought a series of accomplishments related to facilities and equipment maintenance and installation at the Laboratory's Plutonium Facility. For example, the first of twelve trolley control cabinets was installed and employees were trained on how to use the equipment. Modifications to the control equipment include new programmable logic controllers, power supplies, human-machine interfaces, and field cabinets. The trolley system supports the movement of materials, tools, and other parts within the confines of a glovebox environment. Storm drains were replaced to optimize space use and improve safety and drainage. Other achievements included the facility wet-vacuum replacement, firewall upgrades, and a modification to the continuous air monitor blower, which is used to sample and analyze air from multiple points throughout the Plutonium Facility.

First Batch Released of Pit Manufacturing Research and Documentation from Rocky Flats

After months of preparation, personnel on March 31, 2021, environmentally scanned and released for categorization the first boxes of documents obtained from Rocky Flats. The process continues at a steady pace, the objective being to bring historical knowledge on pit manufacturing teams throughout the Laboratory.

The nature of the storage of thousands of documents transferred from Rocky Flats to the Laboratory in August 2020 meant that all documents must be tested for beryllium and other hazards before personnel can review them. Once the environmental team releases a document, records personnel enter the categorization process, which is known as KWIC, short for key-word, index, and categorization.

As of April 15, 2021, 30 boxes had been tested for hazards. Of these, ten were released and six put through the KWIC process. Those six boxes alone contained 13,692 images and pages. The effort is a gargantuan task spanning multiple teams across the Laboratory to ensure documents are categorized correctly, classified, and then made available to those at TA-55 with a need-to-know. The project is expected to lead to millions of dollars in savings in future research and development.

High-Explosive-Shot Test Goes According to Plan

A recent test shot at the Laboratory's technical area used for hazardous material and explosives training went according to plan, thanks to the preparedness and diligence of the Emergency Response team that performed the test. The team understood that there was a possibility that the personnel involved in the test were out of practice — similar shots had not been performed in approximately one year. Thus, team leaders reviewed shot procedures with the entire team and performed the operation at a more deliberate pace than usual.

As part of crew preparation, leaders addressed crew-member roles and responsibilities, as well as Safe Conduct of Research principles. A potential hazard was identified during this time (a grounding strap was not secure on a firing point), which was rectified and thus mitigated potential incident or injury. Personnel fired the shot only after they gathered all the necessary equipment and enacted all the appropriate safety mea-

asures, such as sweeping the area to ensure everyone was in place and that there was no one in the testing area unexpectedly.

Integrated Safety Management System Steering Committee Reaches Back to Lessons Learned

A recent transformation has received a lot of attention lately. This transformation consisted of taking a cluttered, unused office space within the Laboratory's SIGMA Complex and converting it into a workstation that technicians could use without doffing their protective gear. The research technologist who spearheaded this transformation shared her story of how an unmet need was addressed creatively and efficiently by applying safety techniques taken from the Lean Six Sigma world of employee performance and customer satisfaction.

The cluttered room had become a catchall environment for unwanted and unused office supplies, tools, old office equipment, and furniture. When the research technologist realized that the space was not being used, she suggested that it could be transformed into a workstation for the use of technicians who work in the radiological control area (RCA). Before, employees would doff their personal protective equipment (PPE) and leave the area before using the computers or workstations made available to them. By having a workstation within the RCA, employees no longer have to doff their PPE — they can use the computer and workstation located in the “flipped” space in SIGMA, thereby saving time and increasing overall efficiency.

The Integrated Safety Management System steering committee met on April 6, 2021, and discussed this valuable, unique solution to a bothersome problem. Even though the office transformation occurred several months ago, it lives in the Lessons Learned section of the Laboratory's Operating Experience website, and the story continues to be shared throughout the Laboratory.

Join the Laboratory in Achieving “Greener Living” with the New Sustainability Website

The Sustainability Program within the Utilities and Infrastructure Division has unveiled a new and improved Sustainability [website](#). The website provides information on the Laboratory's sustainability initiatives, water

use and management initiatives, green buildings, energy use, and more.

The website also offers information and tips for green living, as well as links where employees can have their lab or office certified under the [My Green](#) LANL programs.

Laboratory Director Thom Mason has already embraced the My Green LANL office certification. The Director's Office will participate in the certification challenge that is part of Earth Week. “I challenge offices and laboratories across the site to join the Director's Office in taking on the My Green LANL program,” Mason said. “My hope is that programs like this will make the Laboratory more conscious of our energy usage, generated waste, and consumption of finite resources.”

Laboratory's ASM Division Completes Its Procurement Program Description Document

As part of its transformation initiative, the Laboratory's Acquisition Services Management (ASM) Division led the development of the newly published Procurement Program Description (PD840). PD840 provides a high-level overview of the procurement function and outlines the roles of each stakeholder in the procurement process. Key changes and process improvements in PD840 include the following:

- Helps all Laboratory staff members involved in the Lab's procurement process better understand procurement principles and the roles of each stakeholder.
- Describes ASM's role in the Laboratory as a strategic business partner; it details how ASM adds value to the organization during the procurement process, from planning to vendor performance management.
- Explains the parameters and requirements of any procurement activity within the Laboratory.

It informs anyone involved in a procurement activity (from Laboratory staff members to suppliers) how each activity contributes to the success of the Lab's mission. To help accomplish the mission, ASM works closely with Triad National Security, LLC (Triad), affiliates to enhance Triad's capabilities and expertise.

Laboratory Director Discusses His Decision to Get Vaccinated

In a video for Laboratory employees, Director Thom Mason talked about the factors that went into his decision to be vaccinated against COVID-19. Mason explained LANL's vaccine stance, namely that vaccination is strongly encouraged but not mandatory. He also explained the Laboratory's progress in vaccinating its approximately 13,000 employees.

"Between the vaccines that we're administering and the vaccines employees are receiving in the community, we're at the point in mid-April that 66 percent of Laboratory staff have had at least one dose of the vaccine," Mason said. "This is our only path back to a life, workplace and community that resemble normal."

Laboratory's Finance Division Launches Internal Newsletter, *The Ledger*

The Finance Division's (FIN's) Operational Excellence Team recently launched a division-wide newsletter known as *The Ledger*. This new newsletter provides a streamlined method of communication for the division in one consistent location. The monthly publication includes a message from FIN's management team, as well as important division updates, office tips and tricks, and answers to employee-submitted questions.

The Ledger strategically informs employees of future training, policy updates, process improvements, ergonomic information, safety shares, volunteer opportunities, and upcoming events. The newsletter has improved the division's internal communication and has enabled operational consistency, a better-informed workforce, and a unified platform for everyone at the division.

LANSCe Multi-Year Upgrade Wraps in Time for May 2021 Beam Cycle

An accelerator-based user facility, the Los Alamos Neutron Science Center (LANSCe) is approaching 50 years of age.

Recently, a serious issue cropped up with LANSCe's front end, which is powered by radiofrequency (RF) systems under the care of the Accelerator Operations and Technology Division. The front end's old tubes were no longer being produced reliably and LANSCe's supply

was running out. Thus, LANSCe had to reduce its beam current by half the normal amount to keep running with the limited supply of usable tubes, and it was at risk of the whole place shutting down.

The solution: engineering, installing, and commissioning a completely new 201-megahertz RF system. The work began in 2013 and is now wrapping up, just in time for the beam to be turned on for LANSCe users in May 2021. Two examples of internal news coverage of this accomplishment:

- [Lab Character John Lyles: Harnessing radio signals for science and spelunking.](#)
- [Upgrading a system at LANSCe: Not unlike repairing an airplane while flying it.](#)

Milestone Achieved on Pit Production Project

The Laboratory recently received Critical Decision 1 (CD-1) approval for the Los Alamos Plutonium Pit Production Project (LAP4), which represents the modernization of the TA-55 footprint and production capability. This approval marks the completion of the project definition and conceptual design phase and authorizes the Laboratory to begin execution. Achieving this milestone is the result of great focus and execution by personnel within the Laboratory's Capital Projects and Weapons Production directorates.

New Liquid-Nitrogen Delivery Vehicle Improves Efficiency, Assists RPT with Mission-Critical Deliveries

After waiting more than two years while a request went through purchasing, the Packaging and Transportation (PT) Gas Facility within the Readiness, Packaging, and Transportation (RPT) Division now has a brand-new ORCA Liquid Nitrogen Delivery vehicle out on the road making deliveries to customers throughout the Laboratory.

"This was a very important truck to the Gas Facility in order to improve efficiency and to have another back-up pumper truck to make mission-critical deliveries in the event that our current liquid nitrogen truck was out of service," said Steven Knight of RPT-PT.

Gas Facility personnel using the truck completed all training through Skype with the vendor. Operating

procedures were updated to reflect the manufacturer's operating steps.

New Roof Walkway Provides Safer Access for Workers, Protects Utilities

MSS-UI (Maintenance and Site Services, Utilities and Institutional Facilities) maintenance crews and LOG-CS (Logistics, Central Shops) Hoisting and Rigging personnel recently replaced an old wooden roof walkway outside the Central Computing Facility Computer Building. This new roof walkway has improved the safety of workers accessing equipment on the roof. The walkway also protects the roof from damage and protects exposed rooftop utilities.

Work was performed as a multi-craft activity consisting of carpenters, ironworkers, riggers, laborers, and pest control technicians. The walkway was funded through the MSS-UI corrective maintenance baseline and completed for \$43,000. Recent additional funding to the MSS maintenance program has enabled this type of work to be performed, in addition to executing normal equipment maintenance.

Safety Communicators Thanked for Their Efforts and Contributions

The Laboratory has operators who run the Emergency Operations Support Center (EOSC) 24-hours per day, seven days a week. These dedicated and talented employees — and others like them across the country — are being celebrated during National Public Safety Telecommunicators Week, which occurs April 11–17, 2021.

Operators receive a vast variety of call topics daily. Examples of calls include reports of bear and mountain lion sightings, accounts of fire-alarm activations, sightings of suspicious packages in offices, and everything in between. In response to these calls, operators must act quickly but calmly, following procedures to respond to each incident or emergency call. The skilled employees who comprise the EOSC team truly help keep the Laboratory safe and secure.

Information about how employees should report emergencies and incidents was also included in the employee newsletter with this announcement.

Series of Hand Injuries Leads Employees to Pause for Safety

After four serious hand injuries occurred onsite in mid-April 2021, Logistics Division Director Brian Watkins (LOG-DIV) convened an all-employee meeting for the division. Watkins extended the invitation to personnel from the Maintenance Site Services and Construction Management divisions. His reason for this extended invitation is that there is much cross-over between employees at all three entities.

In all, thousands of employees received invitations to attend the virtual meeting, which was held on April 20, 2021.

At the meeting, Watkins stressed the detrimental impact these the hand injuries will have on the four employees who suffered them. Of the four, two broke their hands and two experienced lacerations serious enough to require stitches. Although the circumstances that led to each injury vary, the result — significantly injured employees — was the same.

During this talk, Watkins focused on finding ways to mitigate risks associated with fatigue and distractions to prevent future injuries. He asked that every employee take time to talk about hazards at the jobsite before work begins for the day and that they remain vigilant as they work by pausing as soon as they observe any unsafe or questionable activity. Watkins also encouraged employees to walk the jobsite before they began work. Specific things they should look for during such walks include conditions that do not seem safe, any “workaround” traps, and opportunities to improve safety.

Watkins closed out his talk by reminding employees of the process they should use to make jobsite corrections and changes, as well as reinforcing the action of getting support from supervisors, safety officers, peers, WESST (Worker Environmental, Safety & Security Team) representatives, and craft safety advocates.

SI Implements Additional Safeguards to Protect Documents Following Flooded Records Room

The Laboratory's Service Innovation (SI) division has instituted new measures to secure and protect records following a recent flood in a records staging room at the National Security Sciences Building (NSSB). After a pipe burst in the staging area, approximately 30 boxes

of damaged records were shipped to an approved vendor for restoration. Records restoration included freeze-drying, cleaning, and sterilizing. Restoration has been completed and the records are now back at the NSSB.

Because of the flooding event, SI has opted to discontinue using the previous staging area to prepare records for shipment to the Federal Records Center. Instead, SI will use the Laboratory's Records Center, a Vault-Type Room in the NSSB basement. Although this decision will require updates to procedures, it will ensure better protection for records against water damage. Further, the event has prompted administrative improvements to prevent situations like this from happening in the future. The team is updating the online resources website to ensure lines of communication are clear and is brainstorming additional approaches to protect records further.

TA-55 Engineering Wins NA-50 Excellence Award for Its Structural Seismic Program

On July 30, 2020, many Los Alamos area residents experienced the 3.7-magnitude earthquake that took place approximately 50 miles away in Capulin, NM. Although this small quake caused no damage to Laboratory facilities, it served as a reminder that northern New Mexico remains at risk — albeit a low risk — for a larger seismic event.

To help mitigate this risk, Laboratory personnel constantly evaluate facilities to make sure they can hold up, should a big earthquake ever occur. Most recently, TA-55 experts formed a team to evaluate the capitals (the tops) of the columns that support the first floor of the Plutonium Facility (PF-4) at TA-55. Led by Eric MacFarlane of Facility System Engineering at TA-55, the TA-55 Team found that the capitals performed better than expected. As a result of this work, the TA-55 Team on March 2021 received an [NA-50 Excellence Award](#) for the column-capital-testing program.

Testing was performed by the University of Nevada-Reno Earthquake Engineering Laboratory, the TA-55 Facility Operations Division and the Weapons Infrastructure Division. The collaboration is called the Plutonium Facility (PF-4) Column Capital Test Program.

PF-4's capitals are original to the facility, which was built in 1978. Because the facility's exteriors are not strengthened with reinforcing steel, it was not clear

how the capitals might behave during an earthquake. Would they crumble and cause a partial collapse of the laboratory floor at PF-4?

To find out, researchers built identical capitals and columns and tested them at their laboratory in Reno. The structures were loaded with weight — much more than they would ever have experience during any seismic event — until they failed. The capitals performed much better than expected and, in several cases, outlasted the columns. The results of these tests verify that the capitals can withstand an earthquake, thus helping to ensure the safety of workers at PF-4.

COMMUNITY RELATIONS

Employees Donate More Than \$40,000 to Santa Fe's Food Depot for Hunger Relief Across Northern New Mexico

Laboratory employees donated \$41,723 to The Food Depot as part of their annual food drive that concluded last week, estimated to provide more than 166,000 meals to northern New Mexicans facing food insecurity. Also in the past 12 months, Laboratory employees have contributed 233 community service hours to the organization.

Headquartered in Santa Fe, The Food Depot serves the following nine counties in northern New Mexico: Colfax, Harding, Los Alamos, Mora, Rio Arriba, San Miguel, Santa Fe, Taos, and Union. In the past year, The Food Depot has experienced a 30-percent increase in the number of northern New Mexicans needing its services.

Laboratory Director Gives LANL Update to Mesa Vista School Board

The March 31, 2021, Mesa Vista school board meeting included an update from Laboratory Director Thom Mason about a few topics of interest to the board. His presentation covered a few recent science advances, including a generator designed specifically to irradiate cancer cells and software that models brain trauma. Mason also shared the many ways the Laboratory is working to support northern New Mexico, including education pipeline programs and the Employee Giving Campaign.

The Laboratory's efforts with Mesa Vista schools include volunteering (15 Laboratory employees meet with Ojo Caliente Elementary students weekly to tutor them in math and language arts) and the seven-year "Girls in STEM" program, which is helping young students overcome difficult circumstances and pursue STEM careers. Mason ended the presentation by discussing the Laboratory's expectations for the future.

Laboratory Hosts Community Conversation Meeting for Regional Leaders

Laboratory Director Thom Mason gave an update on the Laboratory to more than 100 invited community leaders at a virtual event held on April 7, 2021. Mason discussed the Lab's budget, hiring, and new infrastructure projects. He also highlighted new scientific work and outlined the Laboratory's community plans and priorities. Nina Lanza, Team Lead for Space and Planetary Exploration, was on hand to update the attendees on the Perseverance Rover's first few weeks on Mars, as well as LANL's role in the project.

Laboratory Volunteers Offer One-On-One Tutoring for Students in Española and Ojo Caliente

As schools across northern New Mexico return to in-person classes, many are working to address challenges that have emerged over the last year of enforced online learning. To address these challenges, voluntary tutors from the Laboratory have stepped up to help.

Fifteen Laboratory volunteers currently meet with individual students from the fourth to sixth grade at Ojo Caliente Elementary for at least one hour a week to work on math and language arts. In conjunction with nonprofit Communities in Schools, ten Lab volunteers are conducting similar virtual tutoring at Carlos F Vigil Middle School in Española.

The Laboratory supports its employees in this work by offering paid time off for the time they spend tutoring during the workday. The programs at both schools are set to continue through the end of the school year. Read the [Connections](#) story for more information.

Nineteen Stories in March Celebrate Women's History Month at the Laboratory—and Beyond

In a dynamic collaboration with the women's Employee Resource Groups (ERGs), *National Security Science* magazine personnel from Communication Arts and Services, Nuclear and Radiochemistry, the National Security Research Center, and the Public Affairs Office produced a variety of communications products for both internal and external audiences to commemorate Women's History Month.

A new [webpage](#) captures the history-rich stories and exciting virtual events shared throughout the month of March 2021: videos about the Lab's first "computers"; profiles of groundbreaking women (including Maria Goeppert Mayer and Ariana Rosenbluth); a historical presentation on "The Women of Project Y"; invitations to exclusive film screenings and discussions; snapshots of the women's ERGs; and so much more.

SELECTED MEDIA COVERAGE

[LANL Scientist Studies Sounds on Mars](#)

KRQE News (3/23)

Roger Wiens' job is to investigate the sounds on Mars at the Lab. Through the SuperCam instrument, they can listen to the sound of the wind, the rover moving, and the sound of a laser being fired at rocks.

[LANL, Sandia Officials to be Part of nationwide Virtual Job Fair](#)

KRQE News (3/24)

The U.S. Department of Energy's National Nuclear Security Administration announced they will host a virtual job fair for the Nuclear Security Enterprise, and hiring officials from Los Alamos National Laboratory and Sandia National Laboratories will be present. The virtual job fair will take place on Wednesday, March 31, 2021, from 8 a.m. to 2 p.m. MST.

[How NASA's Oxygen-Making Machine Could Change Mars Forever](#)

Popular Mechanics (3/28)

Nuclear engineer Dave Poston of the Los Alamos National Laboratory says nuclear is an efficient and safe alternative to solar: a single nuclear reactor could replace a football field-sized solar array. You get "more power per kilogram from the reactor than the solar power system," he says.

[Fission Chain Reaction May Trigger Supernovae](#)

Physics—Philip Ball (3/29)

Paul Bradley, who works on nuclear fusion at the Los Alamos National Laboratory in New Mexico, thinks there may not be enough of the specific uranium isotope (uranium-235) that most easily undergoes fission, and that the conditions in the star might not support a chain reaction.

[Perovskite Solar Cells Take a Dip into Large-Scale Production](#)

Materials Today (3/30)

"Our work paves the way for low-cost, high-throughput commercial-scale production of large-scale solar modules in the near future," said Wanyi Nie, a research scientist fellow in the Center of Integrated Nanotechnologies at Los Alamos National Laboratory and corresponding author of a paper on this work in *Joule*.

['It's Going to Touch Everything.' Energy Department Weaves AI into Mission-Critical Work](#)

Federal News Network—Jory Heckman (3/31)

Irene Qualters, the associate lab director for Simulation & Computation at DOE's Los Alamos National Laboratory, said the Lab is working to harden AI algorithms against threats, improving the explainability of AI-produced results and quantifying the certainty AI models have in making predictions. The Lab is also looking at AI's usefulness to study climate and natural disasters. "AI is opening a whole new avenue of exploration and understanding," Qualters said.

[Why the Sun isn't Causing Today's Climate Change](#)

Mashable—Mark Kaufman (3/31)

The sun, thankfully, is an extremely stable star. It still has natural swings in energy output, but they're really small. For example, there are approximately 11-year periods of activity called solar cycles, where the sun's activity increases and then decreases. These changes in energy output are on the order of 0.1 percent, explained Geoff Reeves, who researches space weather at Los Alamos National Laboratory. "The sun has small variations in the amount of light and heat that comes out," said Reeves, noting the last two solar cycles have been below-average in energy output.

[LANL Expanding to Two Additional Spaces in Santa Fe](#)

KRQE—Jami Seymore (4/1)

Los Alamos National Laboratory is growing its footprint in Santa Fe, taking over properties at Pacheco and St. Michael's Drive. The new space will accommodate at least another 500 employees, who may use the offices at different times.

[LANL Team Develops Software Package Known as CICE to Model Changes in Sea Ice](#)

Los Alamos Daily Post—Carol A. Clark (4/1)

With Department of Energy funding, a Los Alamos National Laboratory team developed the software package CICE that calculates the complex physics of sea ice.

[See Where NASA Just Zapped This Odd Martian Rock with a Laser](#)

Mashable (4/4)

"We thought we better check it out," Roger Wiens, a planetary scientist at Los Alamos National Laboratory who leads the SuperCam team, told Mashable. "We're trying to investigate the different types of rocks we see."

[COVID Mutants Multiply as Scientists Race to Decode Variations](#)

Bloomberg (4/5)

When Bette Korber, a biologist at Los Alamos National Laboratory, spotted the first significant mutation in the Covid-19 virus last spring, some scientists were skeptical. They didn't believe it would make the virus more contagious and said its rapid rise might just be coincidence.

[Mexican Spotted Owl Protected In Los Alamos Cleanup](#)

Los Alamos Daily Post (4/5)

To protect a treasured ecological species of Northern New Mexico, Newport News Nuclear BWXT Los Alamos (N3B) recently began its annual task of modifying legacy waste cleanup activities at Los Alamos National Laboratory (LANL) ahead of the Mexican spotted owl's breeding season.

[Core Concept: Muography Offers a New Way to See Inside a Multitude of Objects](#)

PNAS (4/6)

"We built a scanner that was big enough so that we put a little ramp up and drive a Jeep into it and examine the contents of the Jeep and pretty much showed it worked," said Physicist Chris Morris of the Los Alamos National Laboratory.

[Embed Your Start-Up in the 'Secret City'](#)

Los Alamos Daily Post (4/7)

Innovators and start-up companies working to solve national security challenges through advanced materials, advanced computing, artificial intelligence, biotechnology, and space technology are invited to apply for a two-year entrepreneurial fellowship at Los Alamos National Laboratory.

Optical Biosensor Device Aids In Biomarker Identification – New Approach to Blood-Based Tuberculosis Diagnosis

Los Alamos Reporter (4/7)

Work at Los Alamos National Laboratory, in conjunction with its research partners, provides valuable new insights into the diagnosis of tuberculosis using blood tests. A paper in the journal *PLOS ONE* today demonstrates the role that host-pathogen interactions play in detecting key biomarkers in blood, facilitating the diagnosis of disseminated or sub-clinical TB disease.

What NASA's Mars Perseverance Rover Mission Has Achieved in Its First 50 Days

Newsweek—Ed Browne (4/7)

The rover has used its on-board laser to zap nearby rocks, and scientists can use this tool to work out what they're made of. One such rock, named Yeehgo, had signs that water is locked up inside its minerals, Roger Wiens, a geochemist at Los Alamos National Laboratory in New Mexico, told the journal *Nature*.

Why an Intense Fire Season May Be Shaping Up in 2021

Mashable—Mark Kaufman (4/7)

"This year has the potential for a significant intersection between dry fuels and highly accumulated fuels," said Rod Linn, a senior scientist at Los Alamos National Laboratory and an expert in wildfire modeling.

Mars Didn't Dry Up in One Go

Science Daily (4/8)

A research team has discovered that the Martian climate alternated between dry and wetter periods, before drying up completely about 3 billion years ago.

For One LANL Scientist, There's No I in Team

Santa Fe New Mexican (4/10)

Roger Wiens, 61, has been part of two hugely successful NASA projects that have flown to Mars, first with the Curiosity mission that landed on the planet in 2012 and most recently with the ballyhooed Perseverance rover that got there last month.

LANL Director Highlights Lab's 'Other' Work

Albuquerque Journal (4/10)

Los Alamos National Laboratory's hand in the Perseverance mission was on display as Lab Director Thom Mason highlighted work LANL performs that doesn't have to do with national security during a briefing conducted over WebEx on Wednesday.

Colorado River Basin Due for More Frequent, Intense Hydroclimate Events

Environmental News Network (4/12)

In the vast Colorado River basin, climate change is driving extreme, interconnected events among earth-system elements such as weather and water. Also reported in [NM Political Report](#).

New Partnership to Advance High-Temperature PEM Fuel Cells; Focus on Heavy-Duty Applications

Green Car Congress (4/13)

A new partnership comprising Los Alamos National Laboratory, Advent Technology Holdings Inc., Brookhaven National Laboratory, and the National Renewable Energy Laboratory will work over the next few years to bring to market high-temperature proton exchange membrane (HT-PEM) fuel cells.

Physicists on the Verge of Discovering a New Subatomic Particle

KRWG—Madison States (4/13)

Recent experiments conducted in Illinois show the potential for particles that are not predicted by the Standard Model, the system used to classify known particles and forces of nature. Los Alamos Scientist William Louis says Standard Model particles make up only a small part of the universe's composition.

Los Alamos National Lab to Gain Next-Gen Supercomputing System in 2023

Nextgov (4/14)

"LANL has been working towards a strategy for tailoring processors to improve performance and efficiency for its most demanding 3D, multi-physics, multi-link scale, and multi-resolutional problems to move time to solution from about 6 months to 6 days," the Lab's HPC Division Leader Gary Grider told Nextgov Wednesday. "Current CPU and GPU architectures are very inefficient for this class of problems so attempting to tailor processors to our problems is one option we are pursuing."

How New Mexico Became the State with the Highest Rate of Full Vaccinations

New York Times (4/15)

"It's still quite early to know when herd immunity in the state could potentially happen," said Sara del Valle, a mathematical epidemiologist at Los Alamos National Laboratory who is part of a team that meets weekly with the state health department. Ms. del Valle, who said she was impressed by how public health officials took the team's recommendations "very seriously," nevertheless cited challenges ahead such as disparities in vaccine acceptance in parts of the state.

New Method Measures Super-Fast, Free Electron Laser Pulses

Lab Manager (4/15)

New research shows how to measure the super-short bursts of high-frequency light emitted from free electron lasers (FELs). By using the light-induced ionization itself to create a femtosecond optical shutter, the technique encodes the electric field of the FEL pulse in a visible light pulse so that it can be measured with a standard, slow, visible-light camera.

Twelve Los Alamos National Laboratory Teams Recognized for Exceptional Accomplishments

Los Alamos Reporter (4/15)

Twelve teams at Los Alamos National Laboratory are recipients of the Department of Energy's National Nuclear Security Administration's Office of Safety, Infrastructure and Operations' 2020 Excellence Awards, which recognizes exceptional accomplishments made in support of efforts to achieve NNSA's mission.

Vaccines That Can Protect Against Many Coronaviruses Could Prevent Another Pandemic

Science (4/15)

T cells are also central to the vaccine quest of Bette Korber, a computational biologist at Los Alamos National Laboratory. She designs algorithms to scour the genome sequences of beta coronaviruses, looking for regions of viral proteins that can trigger T cell responses, and that vary little among the different coronaviruses. Those conserved T cell epitopes, Korber says, might make a good vaccine.

Los Alamos Researchers Study How Wildfire Smoke Impacts Climate

Santa Fe New Mexican (4/17)

Researchers at Los Alamos National Laboratory have developed a first-of-its-kind tool to learn if smoke from wildfires is warming the climate. The humidified single-scattering albedometer will analyze moisture levels in wildfire smoke plumes and study how water binds with soot particles.

Mars Didn't Lose All of Its Water at Once, Based on Curiosity Rover Find

CNN (4/18)

"A primary goal of the Curiosity mission was to study the transition between the habitable environment of the past, to the dry and cold climate that Mars has now," said Roger Wiens, study co-author on the paper and ChemCam team scientist at Los Alamos National Laboratory.

LANL's Cerreta Named President of the Minerals, Metals and Materials Society

Los Alamos Reporter (4/20)

Ellen Cerreta, the Los Alamos National Laboratory's division leader for Materials Science and Technology, has been named president of The Minerals, Metals, & Materials Society (TMS), a professional society for scientists and engineers in those fields.

New Pulsed Magnet Reveals a New State of Matter in Kondo Insulator

Science Daily (4/20)

A recent series of experiments at the National High Magnetic Field Laboratory (National MagLab) at Los Alamos National Laboratory leveraged some of the nation's highest-powered nondestructive magnets to reveal an exotic new phase of matter at high magnetic fields. Article also appears in [Phys.org](https://phys.org).

LANL Employees Donate More Than \$40,000 to Santa Fe's Food Depot for Hunger Relief Across Northern New Mexico

Los Alamos Reporter (4/21)

Los Alamos National Laboratory employees donated \$41,723 to The Food Depot as part of their annual food drive last week, estimated to provide more than 166,000 meals to Northern New Mexicans facing food insecurity. Laboratory employees have also contributed 233 community service hours to the organization in the last 12 months.

LANL: Machine Learning Model Generates Realistic Seismic Waveforms

Los Alamos Reporter (4/22)

A new machine-learning model that generates realistic seismic waveforms will reduce manual labor and improve earthquake detection, according to a study published recently in [JGR Solid Earth](https://jgr.solidearth.org).

LANL's Terry Miller Is Enmeshed in the Depths of Earth Science

Los Alamos Reporter (4/22)

Terry Miller is a Subsurface Modeling Research Technologist for the Computational Earth Science group at Los Alamos National Laboratory. She commands — and develops — special tools that allow her to peel back and render the hidden layers of geology for subsurface simulations. Her work benefits research into environmental health, cleaner energy, and national security.

As a Hotter, Drier Climate Grips the Colorado River, Water Risks Grow Across the Southwest

Arizona Republic (4/23)

Another group of [scientists at Los Alamos National Laboratory](https://www.osti.gov/science) recently looked at how interconnected

extremes influenced by climate change — from floods to droughts and heatwaves — are expected to intensify in the future in the Colorado River Basin. They found these sorts of [concurrent extreme climatic events](#) “are projected to increase in the future and intensify” in key regions of the watershed.

[New LANL Study Looks at How COVID Misinformation Spreads](#)

KOB-TV (4/25)

COVID was not the only thing spreading for the past year. Researchers at Los Alamos National Labs said they’ve been looking into how misinformation spreads too. LANL information scientists like Ashlynn Daughton are trying to dive a bit deeper into why.

[Prescribed Burns Tamp Down Wildfire Threat](#)

Albuquerque Journal (4/25)

At Los Alamos National Laboratory, we study climate change and its impact on the environment — both natural and human — because they have a direct impact on the things we care about: national security, economic security, energy security, societal security, and environmental protection.

[Los Alamos National Laboratory Touts Biothreat Detecting Device](#)

Homeland Preparedness News (4/26)

Los Alamos National Laboratory (LANL) researchers are espousing the benefits of a device capable of detecting biothreats from samples such as blood, water, CSF, food, and animal samples.